



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee; Engine Endurance Testing Requirements - New Task

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of new task assignment for the Aviation Rulemaking Advisory Committee (ARAC).

SUMMARY: The FAA assigned ARAC a new task to review existing engine endurance test requirements, assess its suitability for all engines, and consider an alternate endurance test and associated methods of compliance. The current regulations may not adequately address the technological advances found in modern engines, as related to the current engine endurance test. This notice informs the public of the new ARAC activity and solicits membership for the Engine Harmonization Working Group (EHWG).

FOR FURTHER INFORMATION CONTACT: Dorina Mihail, Rulemaking and Policy Branch, ANE-111, Engine and Propeller Directorate, FAA, 12 New England Executive Park, Burlington, Massachusetts, 01803, telephone (781) 238-7153, facsimile (781)238-7199; e-mail dorina.mihail@faa.gov.

SUPPLEMENTARY INFORMATION:

ARAC Task Acceptance

ARAC accepted the task and assigned the task to the EHWG, under the Transport Airplane and Engine (TAE) Subcommittee. The working group will serve as staff to ARAC and assist ARAC by providing advice and recommendations of the assigned tasks. ARAC must

review and approve the working group's recommendation report before it will forward it to the FAA.

Background

The FAA established ARAC to provide advice and recommendations to the FAA Administrator, through the Associate Administrator for Aviation Safety, on the FAA's rulemaking activities. This includes obtaining advice and recommendations on the FAA's commitments to harmonize Title 14 of the Code of Federal Regulations (14 CFR) with appropriate foreign authorities' regulations. ARAC's objectives are to improve the development of the FAA's regulations by providing information, advice, and recommendations related to aviation issues.

The EHWG will provide advice and recommendations to ARAC on existing and alternate endurance tests and associated methods of compliance.

The engine endurance test is an accelerated severity test intended to demonstrate a minimum level of engine operability and durability within the approved engine ratings and operating limitations. The test running conditions cover the declared engine rating and operating limitations, but are not intended to simulate the expected in-service operation. To run the test at simultaneous speed and temperature limits, applicants may need to modify the test engine configuration and the required test sequence.

The current practice and accepted methods of compliance allow modifications to the test engine configuration and test sequence, provided certain conditions are met. Specifically, that the engine, as modified, still represents the durability and operating characteristics of the intended type design and complies with § 33.87 requirements. However, experience with past engine certifications shows that for some engines, those modifications are substantial enough

that the engine is not conforming to its type design, thus affecting the test outcome. These difficulties occur because the required test in § 33.87 has not been updated to account for technological advances in gas turbine engines and in-service operational characteristics.

The endurance test requirements originated with the reciprocating engine and were later revised for single-shaft turbine engines with mechanical controls. The test running conditions were designed to match the engine design and operational characteristics during that time and have remained the same for the past 60 years. Today's engines have evolved by up to 10 times increased compression ratio and 40 times increased airflow. They incorporate advanced technologies that include three-shaft designs, high-bypass turbofans, sophisticated full authority digital electronic controls, and complex turbine cooling. Other technological advances provide in-service engine health monitoring, thus improving engine reliability and increased mean time on wing. Modern engine technologies allow up to 50% lower specific-fuel consumption and significant emissions and noise improvements.

Certification experience shows that, due to the complexity of modern engines, the modifications needed to run the required endurance test are substantial, greatly affecting the engine operating cycle and causing reduced airflow, less cooling, or increased temperatures. To compensate for these undesirable effects, applicants make additional engine modifications, such as modifying cooling circuits, grinding blade tips, or adding thermal barrier coating to blades. As a result of these modifications, it becomes increasingly difficult to show that the test engine conforms to the type design. The objective of the ARAC task is to evaluate whether the requirements for engine endurance testing should be revised by adding requirements for an alternate test.

The Task

The EHWG is to review and assess the standards and advisory material for 14 CFR 33.87, engine endurance test requirements as follows:

1. Develop an alternate endurance test that would allow an engine to be tested in the configuration representative of its type design, and
 - a. Maintain compliance with the intent, as well as the basic elements currently in § 33.87, including the ratings, operating limitations, and engine configuration.
 - b. The alternate test is to be equivalent to the test currently in § 33.87 with regards to demonstrating engine operability and durability, and is validated with engine data. The engine data must include experience, certification, and additional component and engine tests.
2. Develop and document recommended:
 - a. Methods of compliance, and
 - b. Rule changes, if considered necessary.
3. Review the current foreign requirements for engine endurance test and determine the need for harmonizing any new methodologies.
4. Provide initial qualitative and quantitative estimates of costs and benefits for any new methodologies.
5. Develop a report containing the recommendations for rulemaking or guidance material, or both, and explain the rationale and safety benefits for each proposed change.
6. The working group may be reinstated to assist the ARAC by responding to the FAA's questions or concerns after the recommendation report has been submitted.

The final ARAC recommendation report should include a summary of the overall work scope, conclusions, and rationale for all recommendations related to the above tasks. It should document both majority and minority positions on the findings, and the rationale for each position and reasons for any disagreement. Any disagreements should be documented, including the rationale for each position and the reasons for the disagreement.

Schedule

The recommendation report must be submitted to the FAA for review and acceptance no later than December 31, 2015.

Working Group Activity

The EHWG must comply with the procedures adopted by the ARAC. As part of the procedures, the working group must:

1. Conduct a review and analysis of the assigned tasks, including any related materials or documents.
2. Draft and submit a work plan for completion of the task, including the rationale supporting such a plan for TAE Subcommittee consideration.
3. Provide a status report at each TAE Subcommittee public meeting.
4. Draft and submit the recommendation report based on the review and analysis of the assigned tasks and any related materials or documents.
5. Present the recommendation at a TAE Subcommittee public meeting.
6. The TAE Subcommittee Chair will provide a status report at each ARAC public meeting and present the final recommendation to ARAC for review and approval. ARAC will forward the recommendation to the FAA.

Participation in the Working Group

The EHWG will be composed of technical experts having an interest in the assigned task. A working group member does not need to be a member representative of the ARAC. The FAA would like a wide range of members on the working group to ensure all aspects of the tasks are considered in development of the recommendations. However, the June 18, 2010 memorandum, *“Lobbyists on Agency Boards and Commissions,”* states that a member must not be a federally registered lobbyist who is subject to the registration and reporting requirements of the Lobbying Disclosure Act of 1995 (LDA) as amended, 2 U.S.C 1603, 1604, and 1605, at the time of appointment or reappointment to an advisory committee, and has not served in such a role for a two-year period prior to appointment. Therefore, the FAA will not select any person that is a registered lobbyist. For further information see the Office of Management and Budget final guidance on appointment of lobbyists to federal boards and commissions (76 FR 61756, October 5, 2011).

If you have expertise in the subject matter and wish to become a member of the working group, write to the person listed under the caption **FOR FURTHER INFORMATION CONTACT** expressing that desire. Describe your interest in the task and state the expertise you would bring to the working group. The FAA must receive all requests by [INSERT DATE 20 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]. The ARAC and the FAA will review the requests and advise you if they approve or disapprove your request.

If you are chosen as a member on the working group, you must represent your aviation community segment and actively participate in the working group by attending all meetings and providing written comments when requested to do so. You must devote the resources necessary to support the working group in meeting any assigned deadlines. You must keep your

management, and those you may represent, advised of the working group activities and decisions to ensure that the proposed technical solutions do not conflict with the position of those you represent when the proposed recommendations are presented to the subcommittee and ARAC for approval. Once the working group has begun deliberations, they will not add or substitute members without the approval of the TAE Subcommittee Chair, FAA Representatives, including the Designated Federal Officer, and the working group.

The Secretary of Transportation determined that the ARAC formation and use is necessary, and in the public interest, in connection with the performance of duties imposed on the FAA by law.

ARAC meetings are open to the public. Meetings held by the EHWG will not be open to the public, except to individuals selected to participate based on interest and expertise. We will make no public announcement of working group meetings.

Issued in Washington, DC, on January 8, 2014.

Lirio Liu
Designated Federal Officer,
Aviation Rulemaking Advisory Committee

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